REMARKS

The amendment filed December 28, 2006 has been entered. Claims 1, 2-10, 12, 14, and 16-22 are currently under consideration. The species elected and under consideration remain as the following:

Host: Aluminum trisoxine (Alq3) alone;

First Dopant (emitter): Formula 2;

Second Dopant (stabilizer not significantly emission color): Inv-1b.

Claims 1, 3-10, 12, 14, and 16-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nakaya et al. (US 6,203,933) in view of Tang et al. (US 4,769,292). According to the Examiner:

> Nakaya et al. teaches organic EL elements comprising light emitting layers including a host material such as aluminum complexes having 8-quinolinol as a ligand with regard to the host material aluminum trisoxine (see col. 33, lines 43-48 and 17-28)("host"). At least one compound according to the Nakaya et al. formula (I) is contained in the light emitting layer in an amount of at least 0.1% by weight (see col. 33, lines 29-31) ("second dopant"). The specific formula (I) compound is taught at col. 11-12 (bottom half of page), compound "1-4). Nakaya et al. further teaches "the light emitting layer may additionally contain another luminescent material in addition to the compound of the general formula (I)" such as those "disclosed in JP 264692/1998" (see col. 33, lines 15-19) ("first dopant"). A patent family equivalent of JP 264692/1998 is Tang et al. (US 4,769,292), which teaches fluorescent coumarin dyes as dopants (see col. 11, line 31 and following). It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the coumarin dye as an additional luminescent component for the light emitting layer, because Nakaya et al. discloses dyes such as those taught in JP 264692/1998 are suitable and Tang et al. teaches in the U.S. patent equivalent of JP 264692/1998 that coumarin dyes are suitable dopants. A *prima facie* case for combining the host, first dopant, and second dopant has been established and since each of the three materials are the same as applicant's materials, the emission properties of claims 1 and 3 are considered to be inherent.
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> With regard to the dopant amounts, the Nakaya et al. formula (I) compound is used in an amount of preferably 0.01-20% weight (see col. 33, lines 38-39). The secondary reference teaches the coumarin dye dopants are incorporated into light emitting layers in amounts within the ranges of claims 4-6 (see Tables, col. 35). In addition, it would have been obvious to one of ordinary skill in the art to have included the "additional luminescent component" ("first dopant") in a similar amount as the formula (I) compound ("second dopant"), because one would expect the additional luminescent component to be similarly incorporated into the device and to perform a similar function as the specifically mention formula (I) luminescent component.

It is noted first that the Examiner has not addressed the differences between the invention of the present claim 1 and the cited art. Once the host **(a)** is selected to be Alq3 as in the election as recited above, it is necessary to select a first emitting dopant **(b)** that:

emits green light with peak emission less than 570nm;
is capable of accepting energy from the host;
is capable of accepting energy from the second dopant;
has a bandgap energy equal to or less than the second dopant;

and a second stabilizing dopant **(c)** that:

stabilizes the device;
is capable of accepting energy from the host;
has a bandgap energy less than the host;
has a bandgap energy higher or equal to the first dopant;
is present in an amount so that the emission color is not significantly affected by the second dopant.

According to Nakaya, a host need not be present and, if present, may be one or more compounds selected from those listed extending from col. 33/ln 44-col. 35/ln 51. The compound of Nakaya most resembling the "second dopant" is the aromatic multi-substituted fused ring aromatic compound of his formula (1). It is clear that this compound can be any of the millions within formula (1) including those specifically identified over the 11 pages extending from col. 4 of Nakaya. It is true that compound 1-4 is the elected second dopant of the invention. However, it is never specifically suggested by Nakaya to combine Alq3 with 1-4, nor is there any suggestion of any particular benefit to combining any particular (a) with any particular (c). In the working examples the only hosts (a) used were Alq3 and TPD (See Examples 1 and 5). The only second dopants (c) used were 2-1 and 2-4 (pentacenes), and 4-1 (anthracene). The combination of Alq3 and 1-4 is not disclosed nor are any reasons that would lead one of ordinary skill in the art to select Alq3 and 1-4 from all of those disclosed and encompassed by Nakaya.

Not only must one select the above two components, one must also select the third component, first green emitting dopant **(b)**. The selection of coumarin green emitting dye is not apparent from all of the possible emitting

compounds identified in the Tang patent. The Tang patent is not particularly focused on the emitting materials. It is focused on the thickness of the luminescent layer. The recitation of emitters is simply a laundry list with no guidance on advantageous combinations. Accordingly, one of ordinary skill in the art would not find the combination of the invention suggested by the combination of references cited. This is especially so because the combination of the invention is required to meet the other claim limitations to get the desired stability result. As the Examiner fully appreciates, each component of an OLED device does not act independently. Due to the interaction of bandgaps etc, a given compound may emit when with one compound and may not emit when with another. Merely finding individual compounds in individual lists does not mean that they can be used together to get a desired result.

Turning to the comparative data at pages 31 et seq. of the application, the following comparatives (all missing the third component) are equally within the teachings of the cited references:

Ex. 1: Alq3 + Inv 1a (quinacridone)

Ex. 5: Alq3 + Inv 6a (quinacridone)

Ex. 9: Alq3 + Inv 8a (coumarin)

Ex. 13: Alq3 + Inv 1a (quinacridone)

Ex. 18: Alq3 + Inv 6a (quinacridone)

Ex. 23: Alq3 + Inv 8a (coumarin)

The data in the application clearly shows that these combinations, within the teaching of the art, are deficient, especially in luminance loss.

The teachings of Nakaya are detailed in the list extending from. at col. 1/ln53 to col. 2/ln38. Construction (1) describes the aromatic multi-substituted fused ring aromatic compound of formula (1). Construction (2) indicates a possible di-substituted nucleus and (3) suggests naphthacene. (5) puts the formula (1) compound in the LEL. (6) and (7) put Alq3 in the LEL along with the aromatic multi-substituted fused ring aromatic compound of formula (1). (8) provides for a "mix layer" with a hole transporting material and an electron transporting material. (9) through (13) provide for added layers in the device. At col. 2/lns 41-55 it is specifically mentioned to use the compound of formula (1) with an emitting host or as a dopant in a mix layer.

At col. 33/ln 33-43, it is noted that it is preferred to use the formula (1) compound in combination with an emitting host in order to alter the light emission wavelength to a longer wavelength. Alq3 is a preferred host material (col.34/ln.42). The compound of formula (1) is preferably a dopant in a mixed layer (col. 35/55 - 36/35). The mix ratio extends from 30/70 to 70/30 (col 36/ln 17). At these ratios, it is clear the mix material is an emitting host rather than an emitting dopant.

In summary, the reference suggests an emitter of formula (1). As described at Col. 2/lns 41-55 "Function and Effect", the compound serves as an emitter. Preferably, there is a second emitter such that the compound of formula (1) serves to lengthen the emission maximum of the second emitter through its own luminescence. Desirably there is a mix host containing a hole transporting and electron transporting compound one of which is an emitter.

The Examiner focuses on col. 33/lns 11-28 as a suggestion that there may be added "another luminescent material". By use of this language, it is clear that the compound of formula (1) is an emitter. Nakaya contemplates that the formula (1) compound will emit and lengthen the wavelength of emission through its own emission. He also contemplates an emitting host as well. There is no contemplation by Nakaya that the compound of formula (1) might be selected to be present while having no significant effect on the emission color, as provided by the claim limitation at the end of claim 1 of this application..

Since the compound (1) of Nakaya is an emitter insofar as his enabling disclosure is concerned, there is no suggestion or motivation in any of the references to combine a host, an emitter, and a compound (1) selected to provide improved stability without significantly affecting the color of the emission. The Examiner argues that the experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. The present application is not about optimizing conditions. It is based on the recognition that there is a function to including the compound of formula (1) even if it does not emit. The enabling disclosure of Nakaya does not suggest use of a non-emitting compound of formula (1).

The examiner agrees many possible compounds are taught; but argues that applicant has not provided clear and convincing evidence within the

scope of the present claims and the scope of the prior art to overcome the art of record. She states: "Per M.P.E.P. § 2145, the arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); In re Geiseler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997)." Applicants submit that the reference, by its own teachings, requires that the added compound modify significantly the emission maximum whereas the claim limitation herein provides for the opposite. This is more than "argument of counsel", it is factual based on teachings of the art. Further , unexpected results have been shown in the examples of the application.

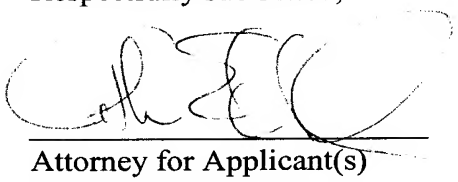
The Examiner also notes that: "since each of the three materials are the same as applicant's materials, the emission properties (i.e., degree of luminescence loss/stabilization improvement, emission color, and bandgap relationships) of claims 1 and 3 are considered to be inherent." Applicants disagree that there is any justification for applying inherency. The specific combination must be suggested by the art in order for inherency to apply. Applicants claim a layer having at least three components: a) an organic host, b) a green light emitting first dopant, and c) a stabilizing second dopant having no significant effect on the color emitted. The patentee teaches all manner of possible combinations including those well-known in the art (combination of emitter and Alq3.) His examples 1-5 teach two-component layers of Alq3 and a pentacene, not a three component layer. Example 6 teaches Alq3 and an anthracene compound. It is not seen how the Examiner can find inherency in these disclosures. Further, it is not understood how one can select a non-emitting version of the compound of formula (1) with reference to the specific bandgap values for the compounds to be selected. It is not about whether compound 1-4 emits, it is about whether it emits significantly in the presence of the other two selected components. It is well-known that a host may emit if in neat form, but if combined with a compound having a lower bandgap, it may not emit at all, transferring all of its energy to the emitter. Thus, there is no basis for finding inherency in the reference.

The Examiner also argues that applicant's use of the term "not significantly affected" is not patentably significant because the term is not associated with a specific degree or range of variance in color. Applicants believe the term is sufficiently clear under the circumstances where the prior art is

focused on affecting the color of the emitted light and the claim limitation makes it clear that there is no significant variation in color by the added presence of the stabilizing component.

In view of the foregoing remarks, the Examiner is respectfully requested to withdraw the outstanding rejection, rejoin the non-elected species, and to pass the subject application to Allowance.

Respectfully submitted,



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